

100 XP

# Design reports to show details

9 minutes

An analytical report layout can integrate a guided analytical experience. That way, the report design is aligned to the automatic and unconscious processes that take place when the report consumer looks at the report.

The guided analytical experience allows navigation between three levels:

- High-level metrics
- Supporting visuals
- Details, when required

You can show details by using four different techniques:

- Use drillable visuals
- Add tooltips
- Add drillthrough
- Embed paginated reports

For a demonstration of the four different techniques, watch the following video.

<https://www.microsoft.com/en-us/videoplayer/embed/RWObCc?postJs||Msg=true>

## Use drillable visuals

The simplest way to show details is to use drillable visuals. The matrix visual is an excellent choice because it allows drilling on rows and/or columns. Therefore, by assigning hierarchies or multiple fields, report consumers can drill to the level of detail that they want. For example, the matrix rows could show years, and the report consumer could drill down to quarter, month, and date levels.

Current sales vs 'What if' analysis						
City	Sales					
<input checked="" type="checkbox"/> Los Angeles, CA, USA	\$179,484					
Power BI	\$45,050					
Excel	\$35,850					
PowerPoint	\$21,920					
Teams	\$12,488					
PowerApps	\$31,896					
Total	\$1,453,823					

### Tip

Ensure that the visual size is sufficient for consumers to view drill-down details, or you can teach your report consumers how to use focus mode to enlarge the visual. Also, you can add buttons to provide a quick way for report consumers to drill to specific levels. This scenario is covered in Unit 4.

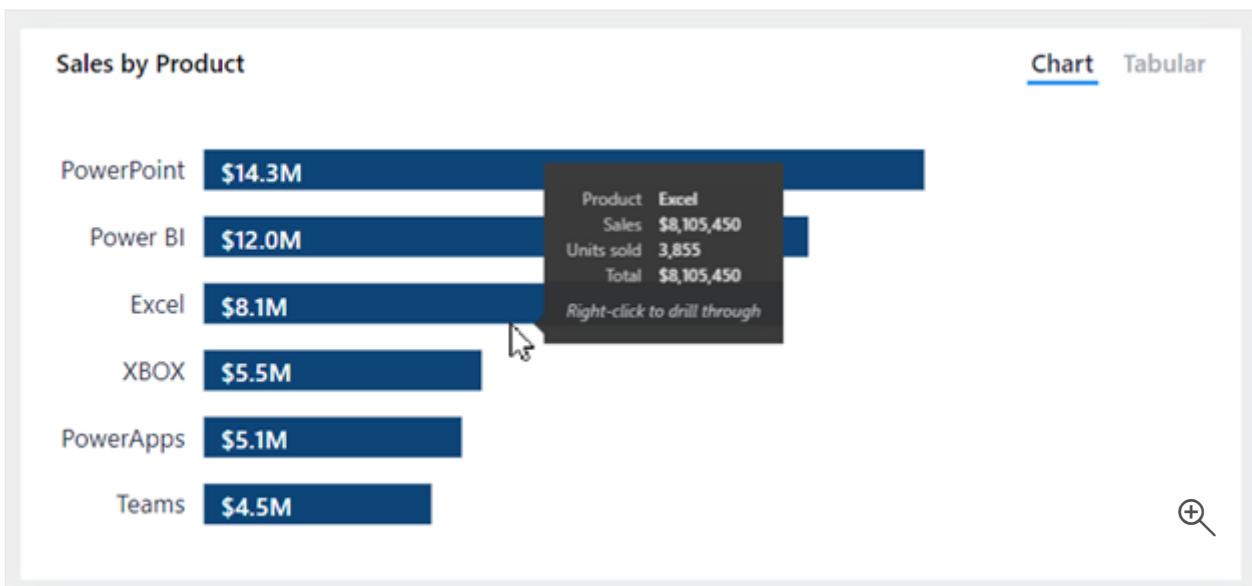
## Add tooltips

Adding tooltips is a simple way to reveal details or provide supporting metrics. In Power BI service, tooltips appear when the report consumer hovers the cursor over an element of a report object. An element could be a column of a column chart or a bubble or region in a map. In a mobile app, tooltips appear when consumers are using the tap-and-hold gesture.

Power BI reports support two types of tooltips: visual and page.

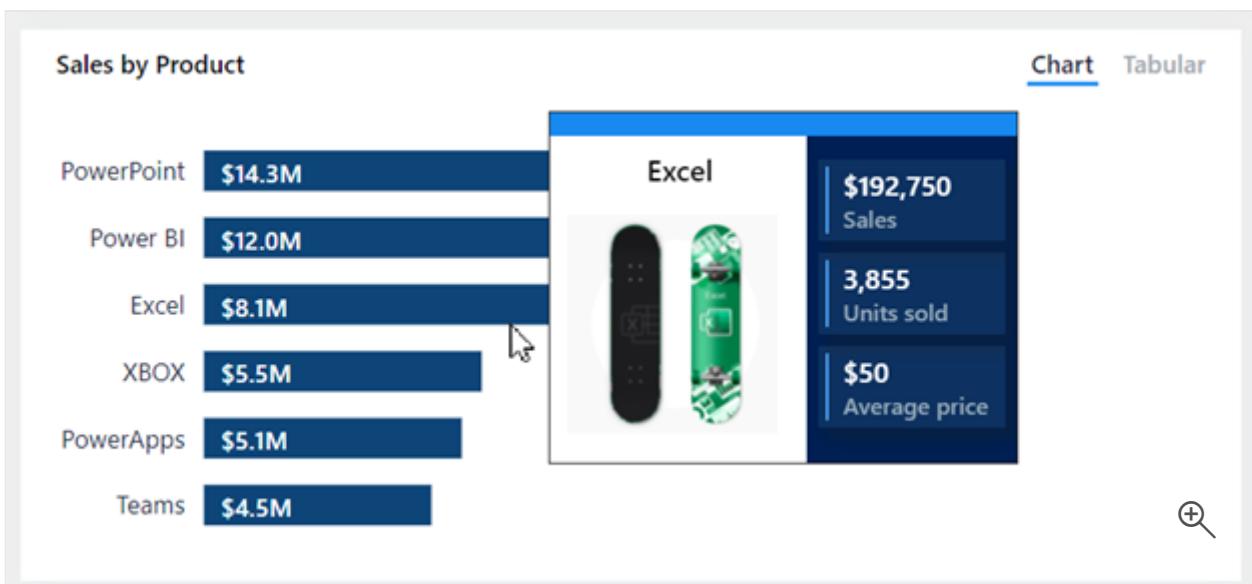
### Visual tooltips

Many Power BI visuals include a **Tooltips** well. Fields that are added to this well is summarized in a tooltip. For example, a column chart visual that shows sales revenue by month could include order quantity as a tooltip. While the height of the column reveals the monthly revenue amount, when a report consumer hovers over the column, a tooltip describes the order quantity for that month.



## Page tooltips

Page tooltips allow your report consumers to gain deeper insights quickly and efficiently from visuals. As its name suggests, a page tooltip is a report page that receives the filter context of the source element. In this way, they are closely related to drillthrough pages, with the difference being that the page tooltip overlays a small page of visuals.



You can associate page tooltips with different report objects, such as:

- **Visuals** - On a visual-by-visual basis, you can configure which visuals will reveal your page tooltip. For each visual, you can have the visual reveal no tooltip, default to the visual tooltips (which is configured in the visual **Fields** pane), or use a specific page tooltip.
- **Visual headers** - You can configure specific visuals to display a page tooltip. Your report users can reveal the page tooltip when they hover the cursor over the visual header icon. Make sure that you educate your users about this icon.

### Note

Page tooltips don't support interactivity. If you want your report consumers to interact with the visuals, create a drillthrough page instead.

For more information, see [Extend visuals with report page tooltips](#).

## Add drillthrough

Drillthrough will navigate the report consumer to a different page, possibly in a different report, and it can show details. The main benefit of drillthrough is that you don't need to clutter a report page with details. Instead, the details are available when required.

A common use case for drillthrough is to allow report consumers to achieve the following flow:

1. View a report page.
2. Identify a visual element to analyze in depth.
3. Right-click the visual element to drill through.
4. Perform complimentary analysis.
5. Return to the source report page.

To enable drillthrough, you can create a report page that provides details. This design approach allows consumers to view supporting transactions and only when needed

### Note

Report consumers might not be aware that drillthrough is supported by a visual. To promote visibility, you can add a button that performs drillthrough. This topic is covered in Unit 3.

For more information, see [Set up drillthrough in Power BI reports](#).

## Embed paginated reports

Use the **Paginated report** visual to embed a Power BI paginated report in your report. Paginated reports can connect directly to source databases, providing you with the ability to present transaction-level detail that's not stored in the Power BI dataset.

You can map fields from your Power BI dataset to report parameter values for your paginated report visual, allowing report consumers to cross filter the paginated report. This way, it can behave like a drillthrough page.

### Tip

In the visual format options, you can enable the toolbar so that report consumers can use the export command. This command can export the paginated report in many different formats, including Microsoft Excel, PDF, Accessible PDF, CSV, PowerPoint, Microsoft Word, MHTML, and XML. Also, unlike the 150,000-row limitation that is imposed by Power BI reports, paginated reports can export up to 1,000,000 rows to Excel while retaining all formatting of the paginated report.

For more information, see [When to use paginated reports in Power BI](#).

For more information, see [Create and use the paginated report visual](#).

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## Next unit: Design reports to highlight values

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How are we doing?     

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# Design reports to highlight values

5 minutes

Highlighting values in reports helps you to quickly communicate important and relevant facts about data. Power BI supports several techniques to highlight values:

- Conditional formatting
- Overlaid analytics
- Anomaly detection
- Specialized visuals

## Conditional formatting

You can use conditional formatting to format table and matrix visuals. With this approach, you can apply rules to highlight specific cells by using:

- Background color
- Font color
- Data bars
- Icons

The following image shows an example of a matrix visual with icons. The icons highlight the **On hand** values.

Inventory on hand breakdown			
City	Units sold	On hand	
[+] Los Angeles, CA, USA	394	850	
[+] Oakland, California, USA	226	459	
[+] Sacramento, CA, USA	527	2,780	
[+] San Diego, CA, USA	412	1,550	
[+] San Francisco, CA, USA	733	1,697	
[+] San Jose, California, USA	324	1,056	
<b>Total</b>	<b>2705</b>	<b>8,1</b>	

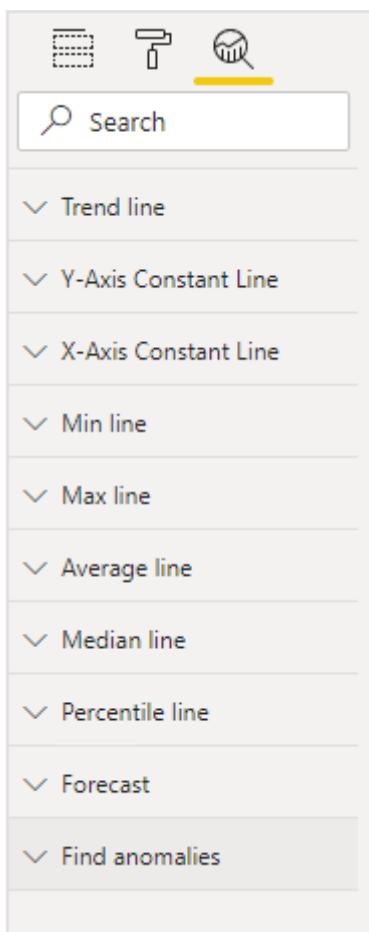
### Note

Consider that report consumers might be blind or have low vision. Take care not to highlight by using only color. Instead, consider using icons that can use shape and color to communicate status.

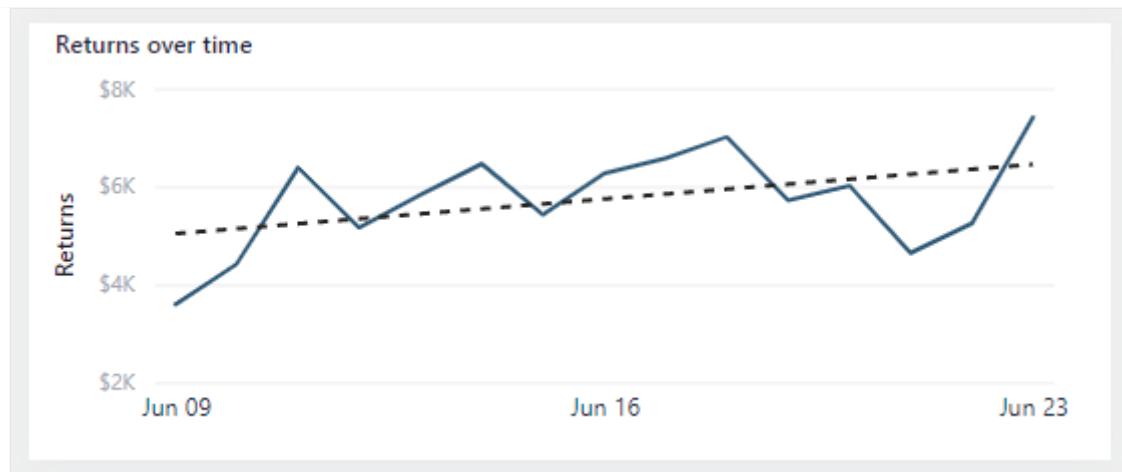
For more information, see [Use conditional formatting in tables](#).

## Overlaid analytics

You can also overlay analytics to highlight values. Certain visuals, like the line chart visual, allow you to add analytic options. Options include trend lines, constant lines, minimum or maximum lines, and many others.



The following image is an example of a trend line. The upward gradient of the trend line clearly indicates that returns are increasing over time.

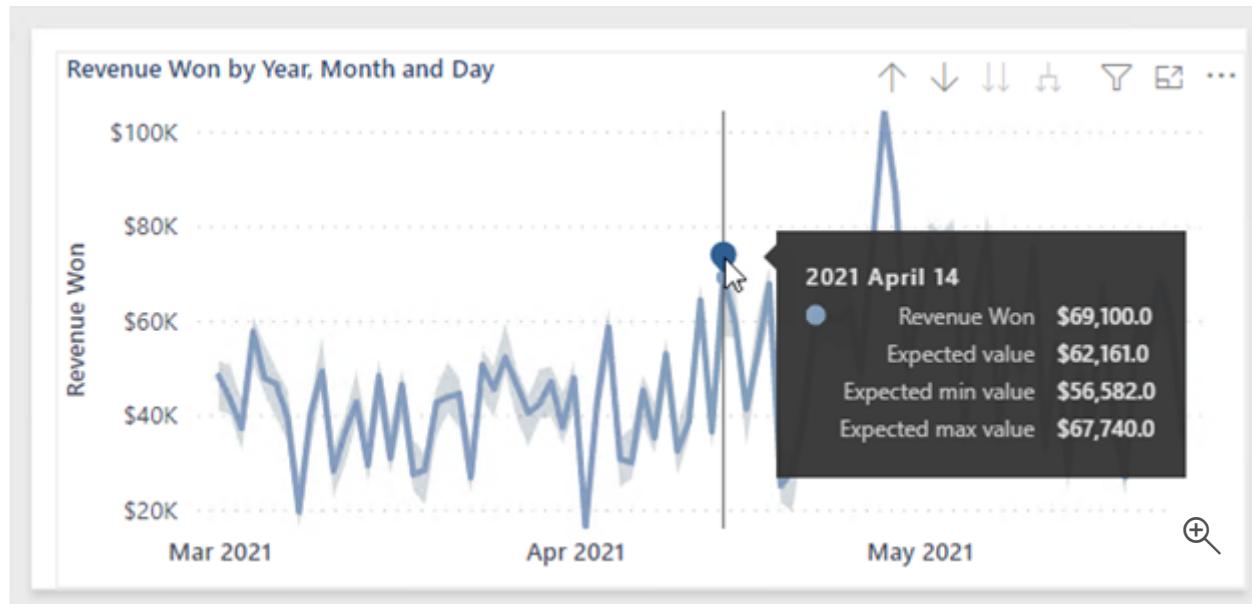


For more information, see [Use the Analytics pane in Power BI Desktop](#).

## Anomaly detection

When a time series (date field) is on the X-axis, two additional analytic options are available. These options use AI to produce a forecast or find anomalies. The anomaly detection feature can help you highlight exceptional values.

The following example shows a line chart visual. Power BI detected an anomaly on a particular date and marked it with a shape. When the report consumer hovers the cursor over the shape, a tooltip appears that describes expected values.



Select the anomaly shape to open the **Anomalies** pane, which lists a series of visuals that provide further possible explanations.

For more information, see [Anomaly detection](#).

## Specialized visuals

Some specialized visuals can help to highlight values in your reports; specifically, the **Key influencers** visual and the **Decomposition Tree** visual. These two visuals are covered in Unit 8.

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## Next unit: Design reports that behave like apps

[Continue >](#)

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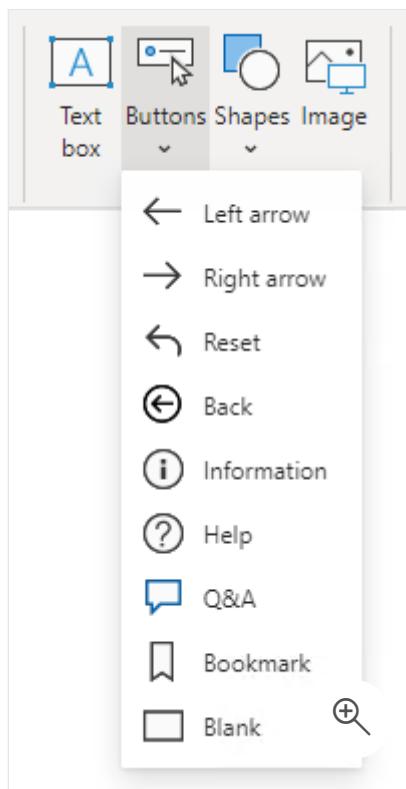
How are we doing?

# Design reports that behave like apps

4 minutes

The button element can take your Power BI reports to the next level by making them behave like an app. Buttons support six different actions that take effect when the button is selected.

When you are inserting a button, many preconfigured buttons are available for you to choose from. These preconfigured buttons include icons and preconfigured actions, such as the Back button, Q&A button, and Bookmark button.



## ! Note

You can assign any type of action to images and shapes so that these elements can behave like buttons.

The **Back** action navigates to the previous page. It's useful in drillthrough scenarios, allowing the report consumer to quickly return to where they drilled from.

The **Bookmark** action activates a selected bookmark. Bookmarks can turn a Power BI report into a guided analytical experience, maximize available page real estate, and provide user-friendly interactions. Bookmarks are covered in the next unit.

The **Drillthrough** action is assigned a target drillthrough destination page. The button remains disabled until drillthrough becomes a valid action, which is the case when you are interacting with a visual that can navigate to the drillthrough page. When the **Drillthrough** action is selected, Power BI navigates to the drillthrough page, propagating appropriate filters.

The **Page navigation** action directs the report consumer to a specific report page. The page can be a specific page that is assigned at design time or a measure that returns the page name. Using a measure allows Power BI to dynamically determine the page based on the filter context.

 **Note**

A measure is a model object that summarizes data. When assigned to the **Page navigation** action, measure formulas, which are written in Data Analysis Expressions (DAX), must return a text value that represents the page name.

The **Q&A** action opens a pop-up window that allows the report consumer to explore data by using intuitive, natural language capabilities and receive answers as data visualizations.

For more information, see [Q&A for Power BI business users](#).

 **Tip**

Unlike the **Q&A** visual, a button that is assigned the **Q&A** action doesn't occupy significant space on the report page.

The **Web URL** action opens the URL by using the default web browser. Like the **Page navigation** action, this action can be a specific URL or one that is returned by a measure. The measure can produce a URL that appends filter context to the query string. For example, if the report consumer filters the page by a single customer, the measure can return a URL to an external system that includes the customer key in the query string.

 **Tip**

Consider using the **Web URL** action to create a bridge to resources that are commonly referenced in tandem. **Web URL** actions can be highly effective in prompting direct action in external systems.

**Next unit: Work with bookmarks**

# Work with bookmarks

7 minutes

Bookmarks are a powerful way to turn a Power BI report into a guided analytical experience. Bookmarks can also help maximize available page space and provide user-friendly interactions. The possibilities are nearly endless, spanning from simple outcomes, such as resetting filters, to more complex behaviors that swap visuals or navigate visual depth.

Commonly, you will add buttons to a report design and configure their actions to apply a bookmark. Shapes and images can also apply bookmarks.

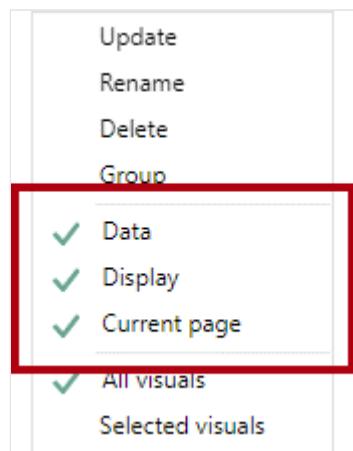
To understand what you can achieve with bookmarks, you need to know how to configure them. You can configure the state that they capture and the scope of visuals that they effect.

## Tip

To ensure that all actions produce the intended result, be as prescriptive as possible when deciding on the enabled states and scope.

## Bookmark state

Bookmarks capture different state, relating to data, display, and the current page. By default, a new bookmark captures all state types, but you can decide to disable any of them.



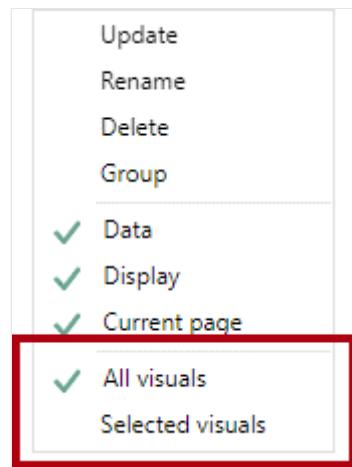
The **Data** state captures anything that impacts the queries that Power BI sends to the dataset. For example, if a slicer is included in the scope of the bookmark, the **Data** state retains the applied slicer items when the bookmark was created (or updated). It will also capture sort order and the drill depth of a visual because the query is impacted.

The **Display** state is related to the visibility of a report object. Objects consist of visuals and also elements like text boxes, buttons, shapes, and images. By using the **Selection** pane, you can hide or unhide objects and groups of objects. Additionally, you can swap visuals on a report page by creating bookmarks that capture hidden and unhidden objects.

The **Current page** state determines whether the bookmark will direct the report consumer to the bookmarked page or apply the current page. Disabling the **Current page** state is rare, but you should consider some creative use cases. For example, on a page tooltip, a bookmark can change the visuals without navigating from the page that the report consumer has selected.

## Bookmark scope

Bookmarks can apply to all page visuals or specific visuals that you select.



The **All visuals** scope is turned on by default, meaning that the bookmark applies to all report objects, even if hidden.

The **Selected visuals** scope will target only those visuals that are selected when the bookmark was updated.

### Tip

Press the **Ctrl** key to select multiple visuals. The simplest way to select multiple visuals is to use the **Selection** pane. Also, when you are creating a selected visuals bookmark that shows/hides several objects, create a group of those objects and configure visibility for the group. That way, you can add or remove objects from the group without the need to update the bookmark.

Setting **Bookmark** scope is best described with an example. For a demonstration on the use of the **Selected visuals** scope, watch the following video.

# Bookmark examples

By combining different bookmark states and scopes, you can create intuitive experiences.

## ⓘ Note

Make sure that you include bookmark requirements in all design decisions. For optimal experiences, you should create bookmarks at the end of report development after you have added all report elements. This approach will help you avoid the complex and time-consuming updating of bookmarks when you're adding new elements.

The ensuing sections highlight common use cases for bookmarks.

## Reset slicers

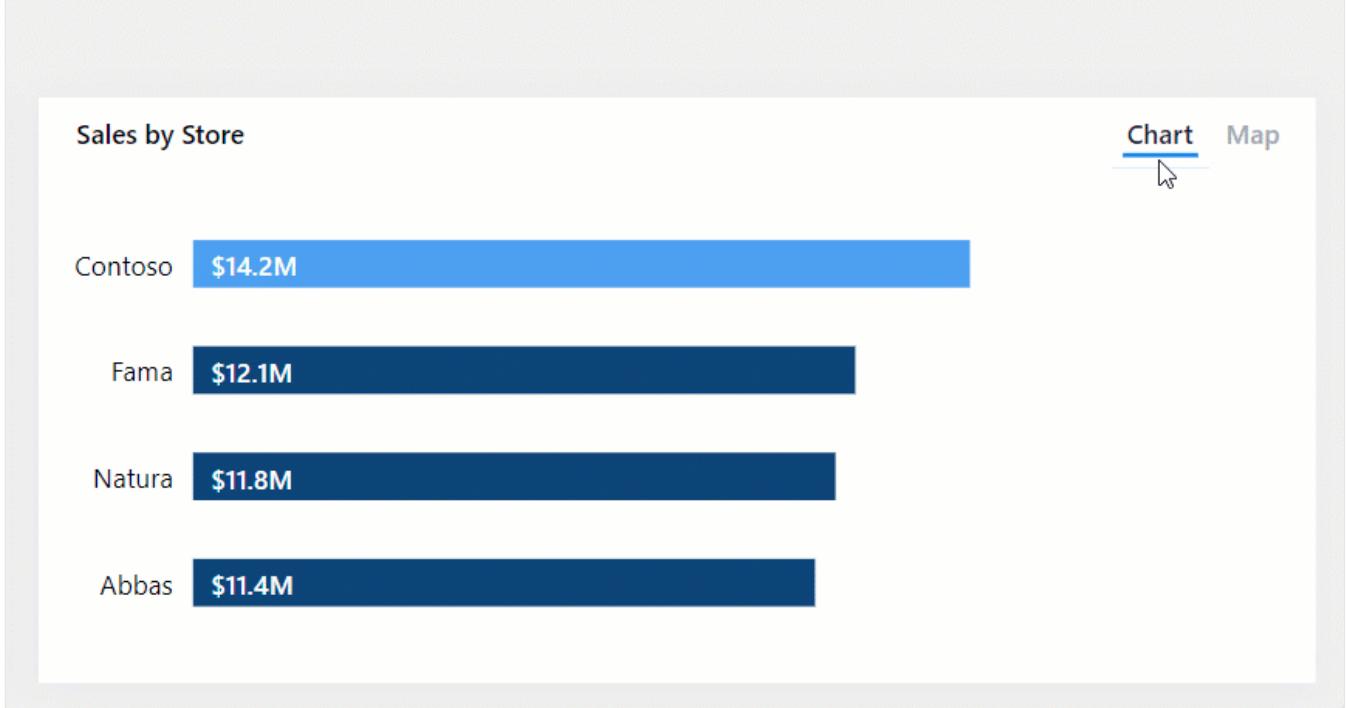
You can provide a simple way for report consumers to quickly reset slicers to a default state by following these steps:

1. Configure the bookmark to capture the **Data** state.
2. Configure the bookmark to use the **Selected visuals** scope, targeting the slicers that you want to reset. The **Selected visuals** scope is key because you don't want to impact other slicers or visuals. For example, if a drillable visual is on the page, the bookmark shouldn't overwrite the drill state when it resets the slicers.
3. Set the slicers to the default values.
4. Update the bookmark.
5. Assign the bookmark to a button action.

## Swap visuals

Swapping a visual means replacing it with another visual. For example, your report can allow the report consumer to select the type of visual, perhaps a chart or a table. Alternatively, you might allow the report user to determine the unit system, whether it's metric or imperial.

In the following example, buttons allow the report consumer to swap a bar chart visual for a map visual.



Swapping a visual requires two bookmarks, and you can do so by following these steps:

1. Configure each bookmark to capture the **Display** state but not the **Data** state. These settings will preserve any sorting or additional filtering.
2. Configure each bookmark to use the **Selected visuals** scope, targeting the initially visible visual and the hidden visual.
3. Update the first bookmark, with one visual as visible and the other as hidden.
4. Update the second bookmark by using the inverse visibility state.
5. Assign the bookmarks to button actions.

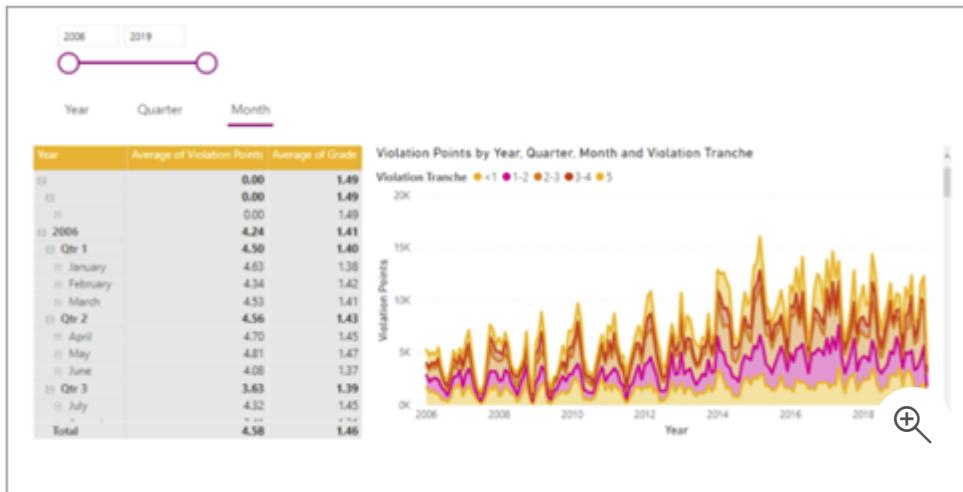
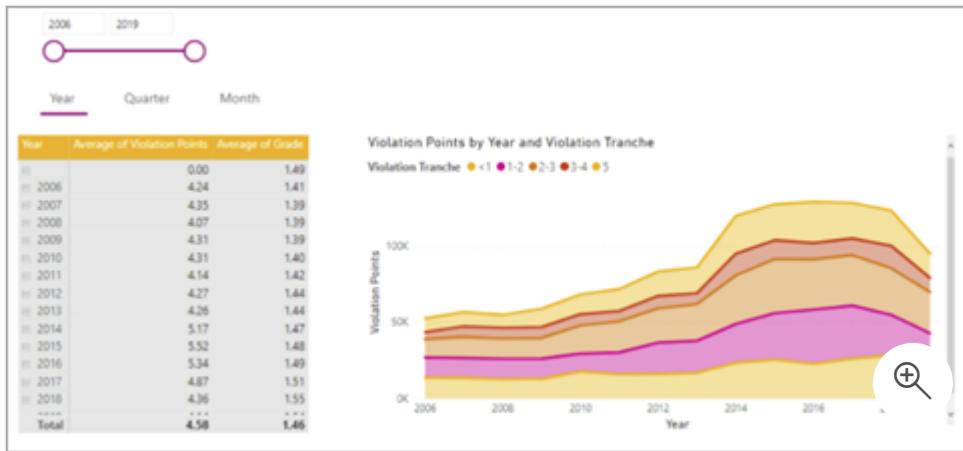
! **Note**

No performance is impacted by having hidden visuals on a page. Hidden visuals don't run queries. Swapping visuals will provide flexible consumption options to the report consumer while retaining optimal performance and making the most out of the report page space.

## Drill down multiple visuals and direct depth navigation

When visuals have many levels of drill depth, buttons and bookmarks can provide report consumers with a quick and simple way to arrive at the required depth.

In the following example, bookmarks navigate the matrix visual and the area chart visual across year and month.



You can create a bookmark for each required drill depth with the following steps:

1. Configure each bookmark to capture the **Data** state, which preserves the drill state of visuals.
2. Configure each bookmark to use the **Selected visuals** scope, targeting the visuals to update.
3. In the visuals, drill down to the required level, and then update the corresponding bookmark.
4. Assign the bookmarks to button actions.

### Tip

In the **Bookmark** scope, consider including a shape or alternate button that appears as highlighted. That way, report consumers will be aware of the selected drill level.

# Pop-up overlays

Use buttons and bookmarks to overlay an image, shape, or text box. A good example of a pop-up overlay is one that provides built-in assistance. Designing reports with built-in assistance is covered in Unit 7.

In the following example, when the report consumer selects the **Help** button in the lower-left corner of the page, a full-page image becomes visible. The image includes many coach marks, which point to the targeted objects on the report page. Also, the image uses transparency so that the underlying report design remains partially visible. When the report consumer selects anywhere on the page, the image becomes hidden (due to an action on the image that uses a bookmark).



Two bookmarks are required for creating a pop-up overlay:

1. Configure the first bookmark to capture the **Display** state.
2. Ensure that the overlay object is visible, and then update the bookmark.
3. Assign the bookmark to a **Help** button action.
4. Configure the second bookmark to capture the **Display** state.
5. Ensure that the overlay object is hidden, and then update the bookmark.
6. Assign the bookmark to the overlay object.

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# Design reports for navigation

5 minutes

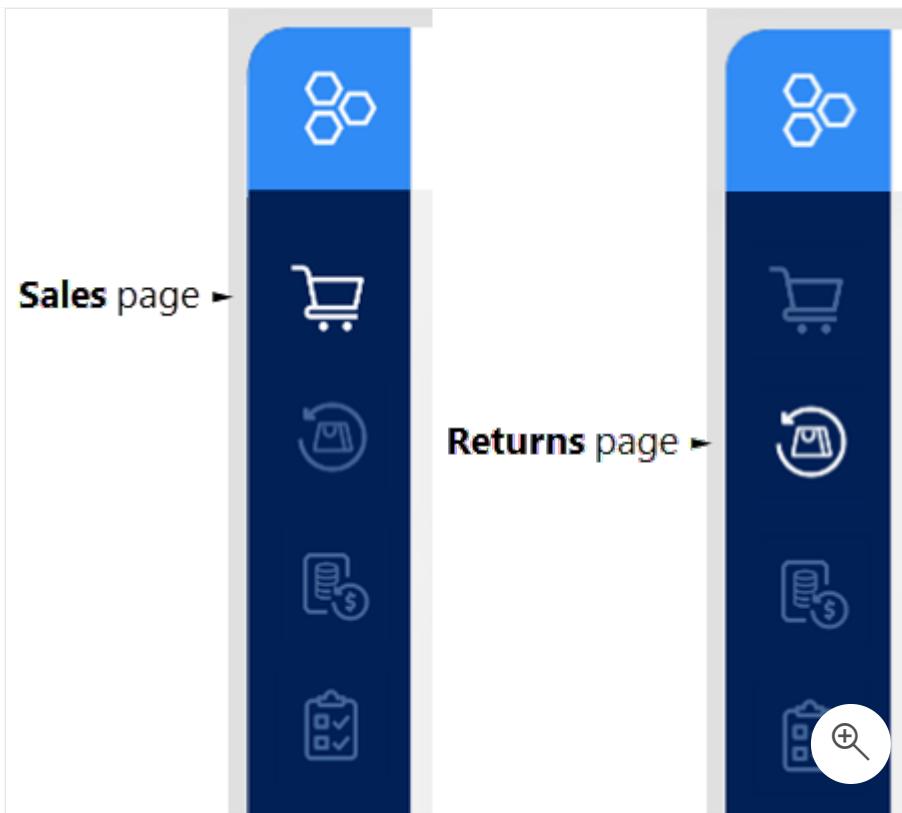
Many different button actions are available to help you configure report navigation experiences. While buttons enable navigation, the report and button layout is critical to ensure that report consumers can efficiently navigate within the report.

**Tip**

To ensure seamless integration into your report design, these UX components should be considered early in the design process. Retrofitting buttons and actions to a report design can lead to an unintuitive and disjointed experience for report consumers.

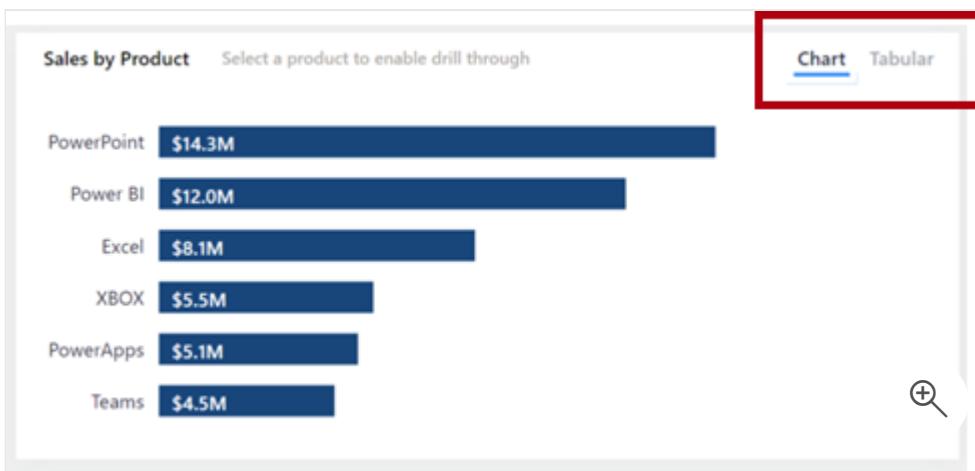
Buttons should be placed in relevant and consistent locations. A button is only valuable if it's easy to find. To promote ease of discovery, ensure that buttons are placed in a relevant and consistent location on the report page.

In the following example, buttons that are located along the left side of the report page allow report consumers to navigate between pages. Most important, they're placed in the same location and in the same order on all report pages. The button that represents the current page is formatted in a way to highlight the icon.



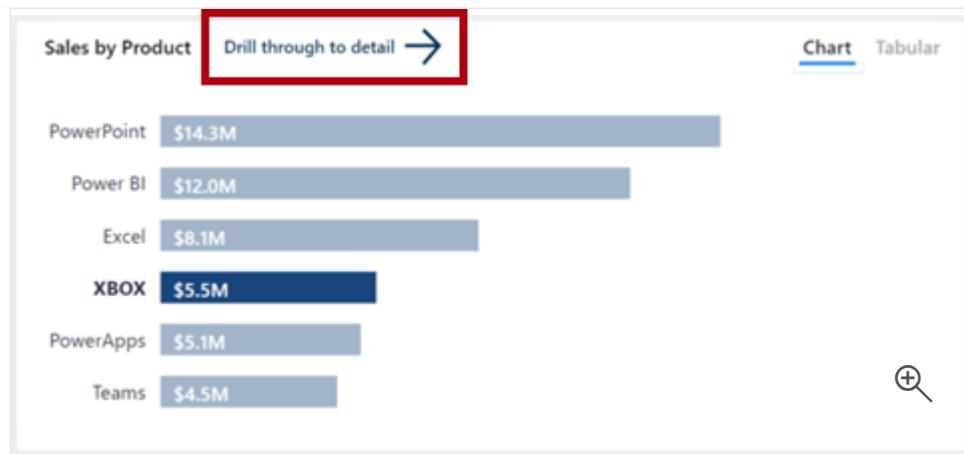
When a button only impacts one section of a report, you can place it within that section so that it's clear to report consumers that the action applies only to that section.

In the following image, two buttons are located in the upper-right corner of a section that allows the report consumer to switch between visual types.



Similarly, if a button action drills through to a page, place it as close as possible to the visual that activates it.

In the following image, the **Drill through to detail** button is located above the visual that activates it.



On the drillthrough page, ensure that a back button will provide a simple way for the report consumer to return to where they drilled from. An established convention is to use a left-pointing arrow icon for the button.

### ! Note

Power BI automatically adds a back button, which is located in the upper-left corner of the page. The button icon is a left-pointing arrow.

ONTOSO KATEBOARD STORE

SALES DETAIL

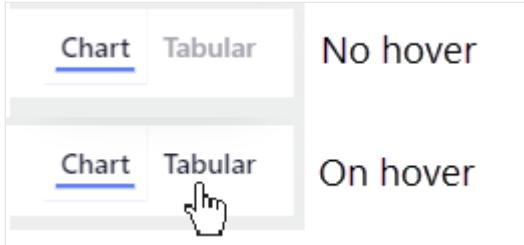
Select a date range 6/9/2021 6/23/2021

Type	Category	Product	Store	City	Date	Price	Sales
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/09/2021	\$1,200	\$12,279
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/10/2021	\$1,200	\$12,518
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/11/2021	\$1,200	\$11,070
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/12/2021	\$1,200	\$9,142
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/13/2021	\$1,200	\$9,200
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/14/2021	\$1,200	\$10,988
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/15/2021	\$1,200	\$8,898
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/16/2021	\$1,200	\$7,660
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/17/2021	\$1,200	\$7,884
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/18/2021	\$1,200	\$3,470
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/19/2021	\$400	\$2,684
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/20/2021	\$400	\$3,330
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/21/2021	\$400	\$2,381
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/22/2021	\$400	\$2,300
In store	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/23/2021	\$400	\$1,876
Online	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/09/2021	\$2,400	\$22,217
Online	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/10/2021	\$2,400	\$24,798
Online	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/11/2021	\$2,400	\$19,198
Online	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/12/2021	\$2,400	\$1/
Online	XBOX	XBOX	Contoso	Los Angeles, CA, USA	06/13/2021	\$2,400	\$1/
Total						\$840,000	\$55,5

Buttons need to be clearly interactive. If a button doesn't appear to be interactive, the report consumer might not notice it. To help in their discovery, you can apply two formatting options: on-hover formatting and descriptive tooltips.

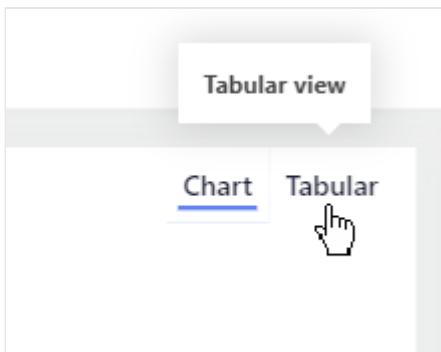
## On-hover formatting

You can configure buttons to change their state when a hover over is available. When the report consumer hovers the cursor over a button, the cursor icon changes to a pointing finger, which indicates that the button is selectable. In this example, the **Tabular** button text is light gray by default, but when they hover the cursor over, it darkens to black.



## Descriptive tooltips

In addition to on-hover formatting, you can configure tooltips to concisely communicate what the button does.



### ! Note

Enable and enter the tooltip text in the **Action** section for the button.

## Next unit: Work with visual headers

[Continue >](#)

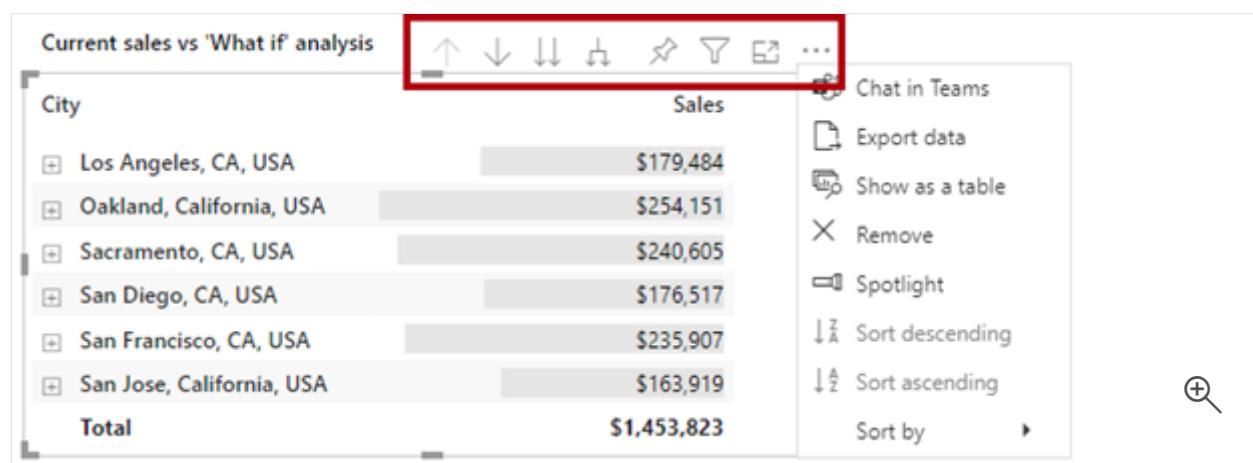
How are we doing? ★ ★ ★ ★ ★



# Work with visual headers

5 minutes

Visual headers make many interactions available to report authors and consumers. All report objects, including visuals and elements (like buttons), have a visual header. The visual header appears when you hover the cursor over the report object, and they can launch actions like focus mode, drill up, or drill down. You can also access the **More options** menu by selecting the ellipsis (...) button. This menu includes sorting options, export, spotlight, and many others. By default, visual headers are enabled for all report objects.



Visual headers might appear in the upper or lower part of the object. Power BI attempts to show visual headers in the upper right of the object if sufficient space is available between the upper part of the object and the edge of the page. If no space is available in the upper part, Power BI will place the visual headers in the lower-right corner of the visual. If no space is available in either location, it will place the headers inside the visual in the upper right.

## Tip

Always leave sufficient space for the visual headers to appear in the upper-right section of objects. This approach ensures a consistent experience for report consumers. Also, take care not to overlap objects because superimposed visual headers make it difficult for consumers to see or select icons.

A report setting is available for you as the report author to disable all visual headers. When visual headers are disabled they will still be visible when editing the report, but they will be hidden for report consumers (in reading view). However, situations might occur where enabling this option is a good idea because it limits most interactions. It might make sense to

disable visual interactions when you are delivering a Power BI report to an audience that's unfamiliar with Power BI or when you don't expect them to interact with the report.

Visual headers can be turned off for a single object. A good report design turns off visual headers for objects that don't need them. Therefore, consider turning off visual headers for slicers and buttons and any other object that won't be used to launch actions. Fewer visual headers will produce a cleaner and less distracting end result.

For those objects that have visual headers, consider disabling functionality that's not appropriate or useful. You can disable all visual header icons, including the **More options (...)** menu.

 **Note**

At design time, the icons will still appear to help you create the report. However, when the report opens in reading view, the icons won't appear.

By enabling the visual header tooltip icon, you can enter a text value or reference a page tooltip. This topic is covered in the next unit.

For more information, see [Using improved visual headers in Power BI reports](#).

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## Next unit: Design reports with built-in assistance

[Continue >](#)

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How are we doing?     

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# Design reports with built-in assistance

3 minutes

Training report consumers on how to use and navigate your reports can be difficult because every report that you create will be different. Features and functionality that are present in one report might not be present in another. Creating intuitive and simple-to-navigate reports is important. When approaching a report design project, you should always aim to provide "no training required" experiences. Strive to add built-in assistance whenever possible.

Several design techniques that can provide built-in assistance include:

- Information page
- Visual header tooltip icon
- Button with overlay

 **Tip**

Every report consumer will approach a report with a different expectation of how to interact with it. Therefore, to avoid handling support requests, take extra initial effort to ensure that the functionality is as discoverable as possible.

## Information page

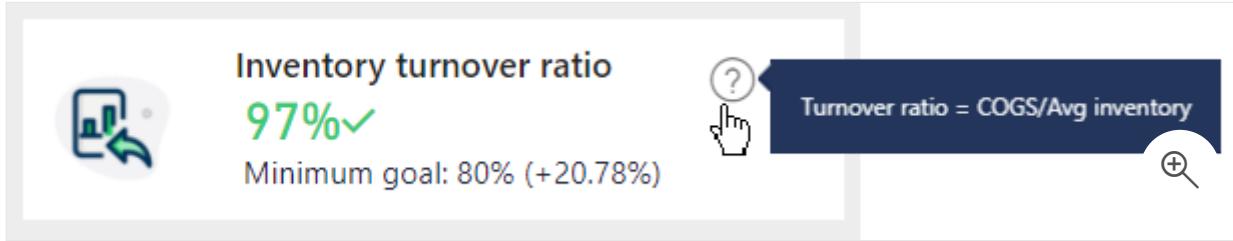
Adding an **information page** is the most simplistic technique. Dedicate an entire report page that includes instructions and definitions.

 **Tip**

Consider adding a back button to the page. Then, add a button in a consistent location on each page that navigates to the information page. Configure these buttons to use the **Information or Help** icon.

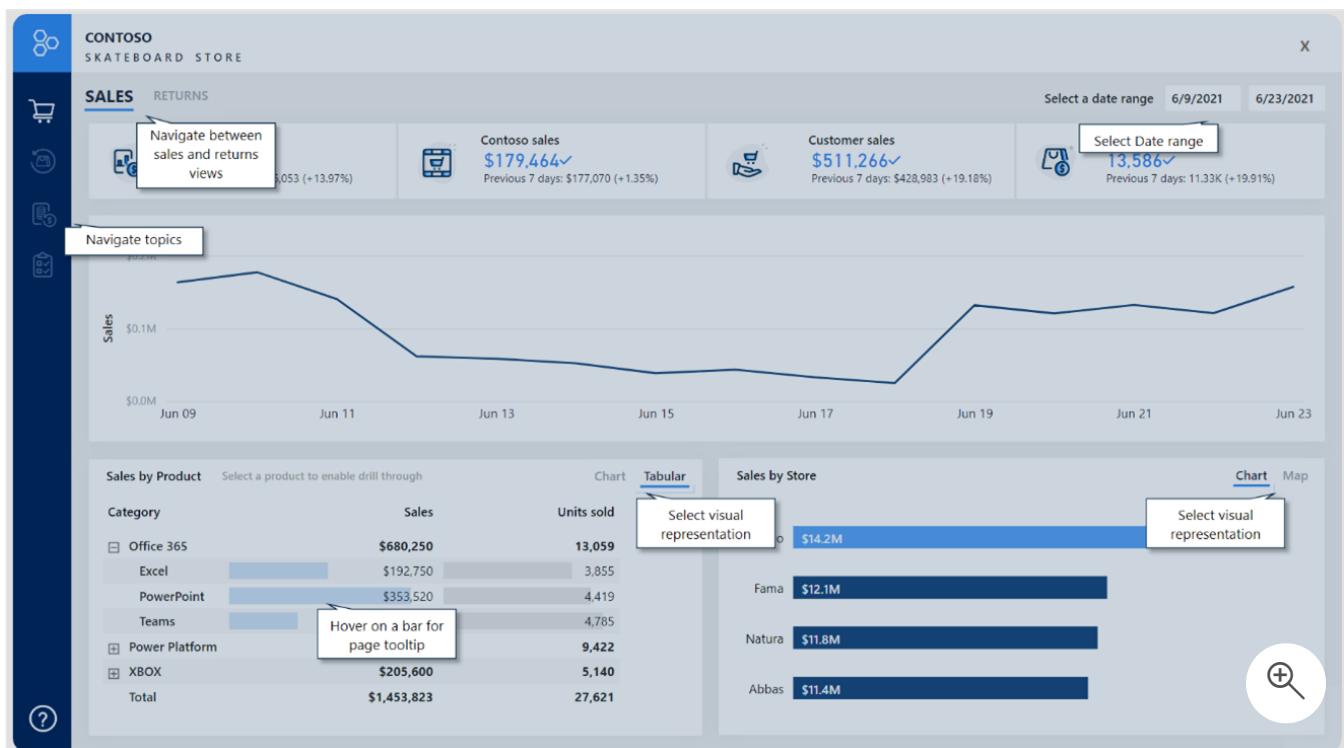
## Visual header tooltip icon

Within the visual header options, you can enable the visual header tooltip. It adds the Help (?) icon to the visual header. Then, you can assign a page tooltip or text. This technique is beneficial for providing visual-specific guidance, such as more detail that describes definitions, calculation logic, or the source of data.



## Button with overlay

You can use buttons and bookmarks to overlay an image, shape, or text box that provides built-in assistance. Unit 4 of this module provides an explanation of how to create the bookmarks to support this scenario.



## Next unit: Tune report performance

[Continue >](#)

How are we doing? ☆ ☆ ☆ ☆ ☆

# Tune report performance

4 minutes

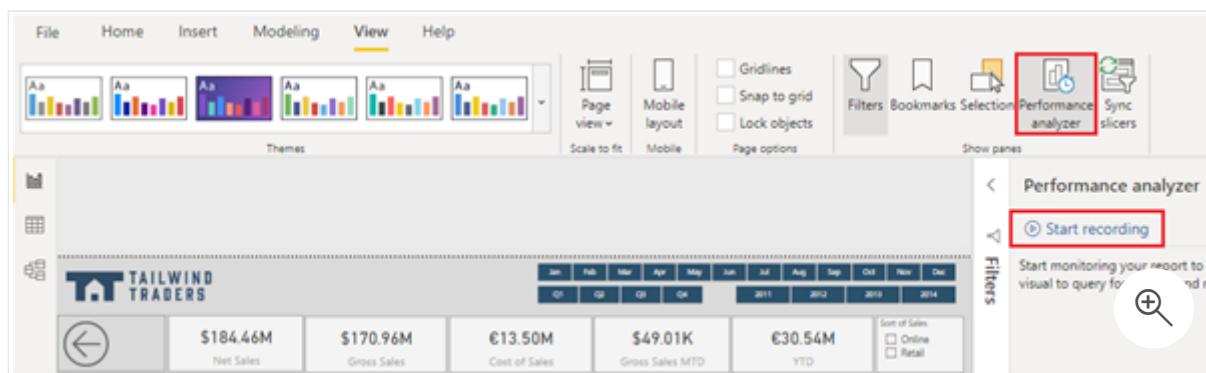
When you have finished creating your report, the performance of that report depends on how quickly data can load onto the report page. You should test your report in the Power BI Report Server to see how it works from a user's perspective. If you experience issues, or if the report users have reported issues, you need to investigate the cause of those issues and take measures to tune the report for more optimized performance.

## Analyze performance

To investigate the cause of issues, your first step is to use the **Performance analyzer** tool within Power BI Desktop. **Performance analyzer** allows you to discover how each of your report elements, such as visuals and DAX formulas, are performing. **Performance analyzer** provides you with logs that measure (in time duration) how each of your report elements performs when users interact with them. By examining the durations in the logs, you can identify which elements of the report are the most (or least) resource intensive. You can find where bottlenecks exist, which is a good starting point for making changes.

Before you run **Performance analyzer**, ensure that you clear the visual cache and data engine cache; otherwise, the results will not be accurate. Also, you should set up the report so that it opens on a blank page.

When you have cleared the caches and opened the report on the blank page, to run the **Performance analyzer**, go to the **View** tab, select **Performance analyzer**, and then select **Start recording**.



Interact with your report as you would expect a user to, and then stop the recording. The results of your interactions will display in the **Performance analyzer** pane as you work. When you are finished, select the **Stop** button. Then, you can analyze the results in the **Performance**

analyzer pane. Performance results of each item in the report will display, in milliseconds, under the **Duration** column. The following image shows that all items on the report take less than two seconds to load, which is acceptable. You can expand an item in the list to view more detailed information and identify the exact cause of the issue, such as the DAX query, the visual display, or something else (other).

The screenshot shows the 'Performance analyzer' pane with the following data:

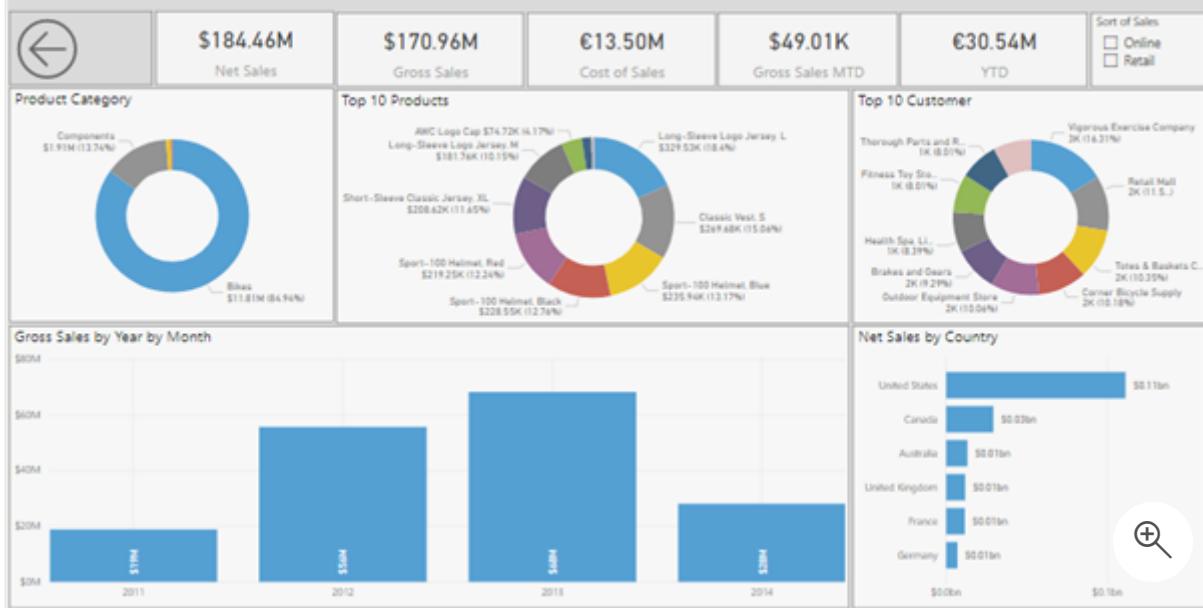
Name	Duration (ms)
⌚ Recording started (16/06/2020 00:13:52)	-
📄 Changed page	-
+ Net Sales	1435
MTD card	1491
DAX query	46
Visual display	31
Other	1414
📄 Copy query	
+ YTD card	1983
+ Cost of Sales	1550
+ Cross Sales	1655
+ Gross Sales by Year by Month	1312
+ Net Sales by Country	1831
+ Top 10 Products	1355
+ Top 10 Customer	1587
+ Product Category	2023
+ Sort of Sales	1034
+ Slicer	1726
+ Slicer	1190
+ Slicer	
+ Image	
+ Button	115

If you want to examine the DAX query, select **Copy query** and then paste it into DAX Studio for further analysis. DAX Studio is a free, open-source tool that is provided by another source that you can download and install on your computer.

## Tune performance

The results of your analysis will identify areas for improvement and highlight items that you need to optimize.

A common reason for poor performance is too many visuals on the same page. The following image shows an example of a busy page that contains several visuals.



If you identify visuals as the bottleneck that has caused poor performance, take the following measures to tune the report:

- Reduce the number of visuals on the report page because fewer visuals means better performance. If a visual is not necessary and doesn't add value to the user, you should remove it. Rather than using multiple visuals on the page, consider other ways to provide additional details, such as drillthrough pages and report page tooltips.
- Reduce the number of fields in each visual. The upper limit for visuals is 100 fields, so a visual with more than 100 fields will be slow to load (and will look cluttered and confusing). Identify fields that are not valuable to the visual and then remove them.

If you find that visuals are not causing the performance issues, you should assess the DAX query results that are displayed in the **Performance analyzer** pane and investigate those results further. For example, you might need to look elsewhere in your data model, such as the relationships and columns.

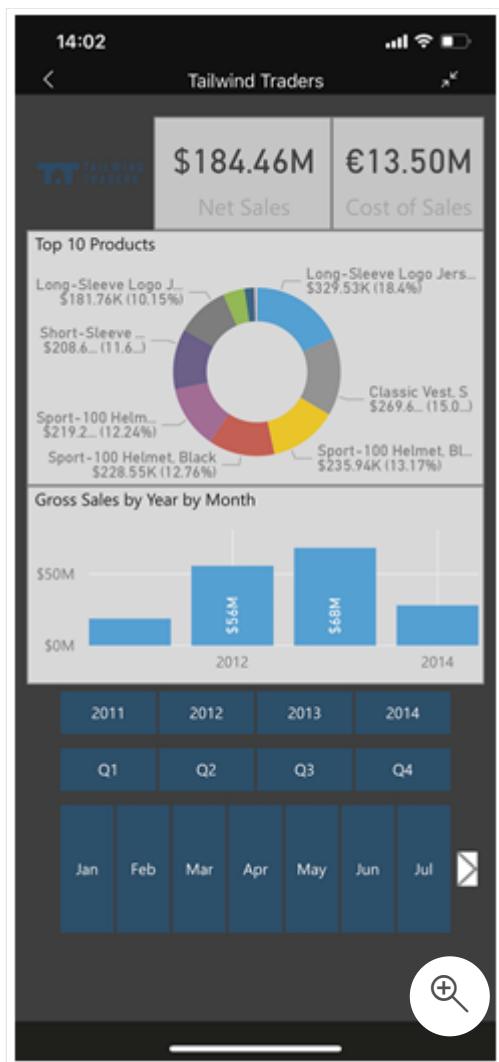
In circumstances where you have made necessary changes to tune report performance and have established that the report is performing well, but some users are still experiencing poor performance, other factors might be affecting performance. These factors include the bandwidth, server, firewall, and other external, uncontrollable factors. You might need to speak to the IT team in your organization to see if they can explain why users are experiencing poor performance when using your reports.

## Next unit: Optimize reports for mobile use

# Optimize reports for mobile use

3 minutes

Some of your report users will want to view your report on their mobile phone or tablet. While they can view any Power BI report page in landscape orientation, you might want to create an additional view that is optimized for mobile devices and displays in portrait orientation. Power BI gives you the power to use visuals that make sense for mobile users and rearrange those visuals in the most effective way.



When you have finished creating your report for the regular web view, you can then change the report so that it's optimized for use on phones and tablets.

To create a mobile-optimized version of your report, you can:

- Design a mobile layout view, where you can drag and drop certain visuals onto a phone emulator canvas.

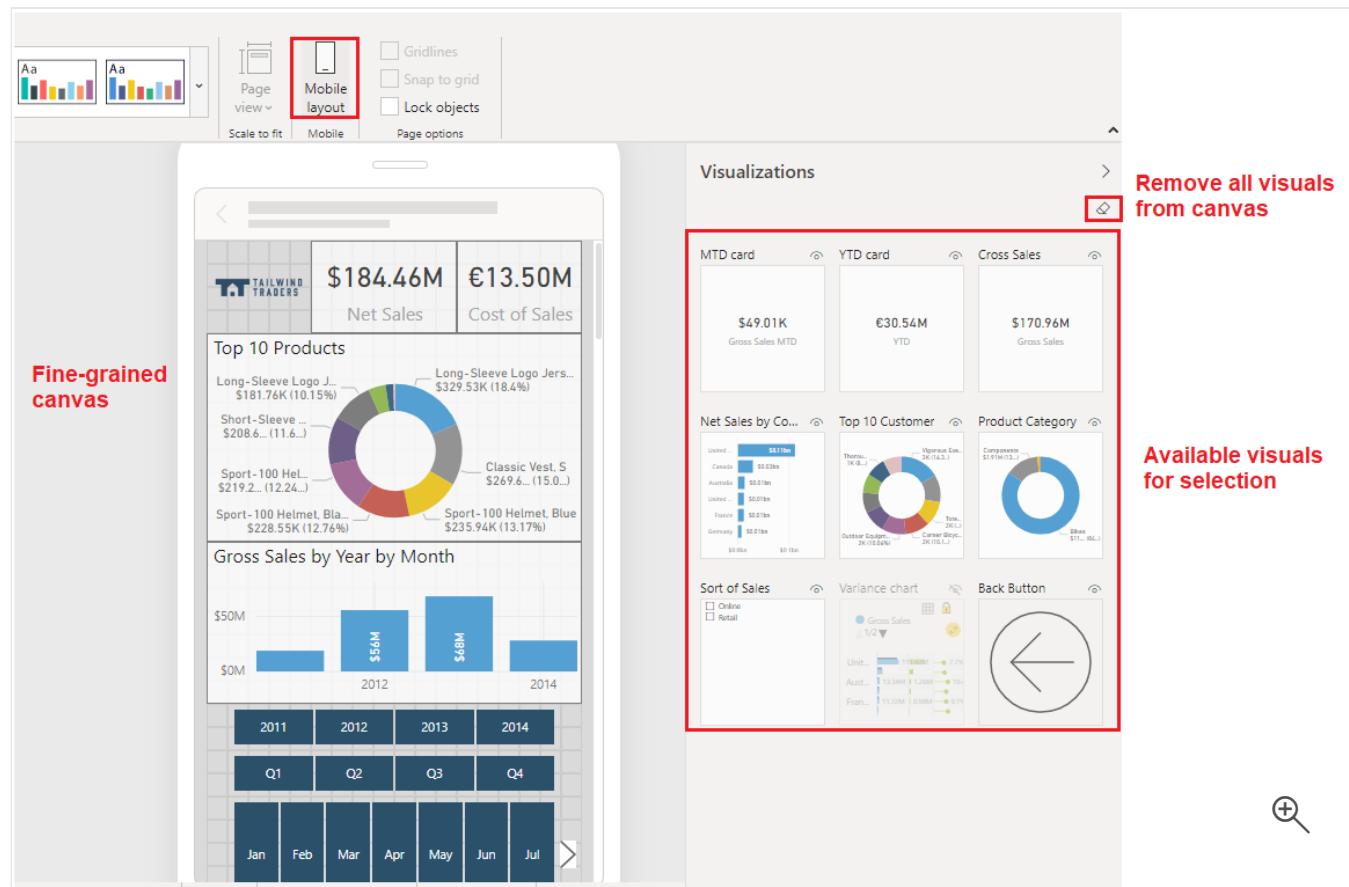
- Use visuals and slicers that are suitable for use on small, mobile screens.

To publish a mobile-optimized version of your report, you can publish the main report as you did previously. The web and mobile versions are published at the same time.

## Design a mobile report layout

To design the mobile-optimized view of a report page, start by opening the mobile layout view for that page. In Power BI Desktop, open the specific report page, select the **View** tab, and then select **Mobile layout**.

This selection will result in showing a scrollable canvas that is shaped like a phone and a **Visualizations** pane that lists all visuals on the original report page. Each visual appears with its name, for easy identification, and a visibility indicator that is useful when you are working with bookmarks. The visibility indicator of a visual will change depending on the visibility status of the visual in the current state of the web report view.



To add a visual to the mobile layout canvas, drag the visual from the **Visualizations** pane to the phone canvas, or double-click the visual in the **Visualization** pane. You can then resize and reposition the visual in the same way that you would a report page. Repeat these steps to add other visuals to the mobile layout canvas.

The screenshot shows the Power BI mobile report authoring mode interface. At the top, there are several options: 'Page view' (selected), 'Mobile layout' (selected), 'Gridlines', 'Snap to grid', and 'Lock objects'. Below this is a toolbar with icons for 'Scale to fit', 'Mobile', and 'Page options'. The main area displays a mobile report with the following components:

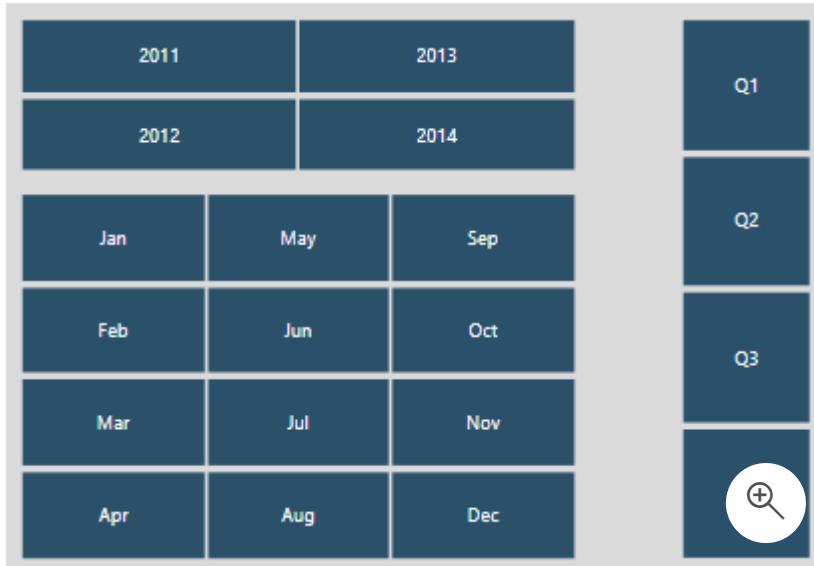
- Top-level summary:** Two large boxes showing '\$184.46M' (Net Sales) and '€13.50M' (Cost of Sales).
- Top 10 Products:** A donut chart showing the distribution of sales by product category. Data points include:
  - Long-Sleeve Logo Jersey: \$329.53K (18.4%)
  - Classic Vest, S: \$269.6... (15.0...)
  - Sport-100 Helmet, Blue: \$235.94K (13.17%)
  - Sport-100 Helmet, Bla...: \$228.55K (12.76%)
  - Sport-100 He...: \$219.2... (12.24...)
  - Short-Sleeve ...: \$208.6... (11.6...)
  - Long-Sleeve Logo J...: \$181.76K (10.15%)
- Gross Sales by Year by Month:** A bar chart showing annual sales growth from 2011 to 2014. The chart has three bars labeled '\$5M', '\$5.5M', and '\$6.5M'.
- Visualizations sidebar:** On the right, there's a sidebar titled 'Visualizations' containing several cards:
  - MTD card:** Shows 'Gross Sales MTD' at '\$49.01K'.
  - YTD card:** Shows 'YTD' at '€30.54M'.
  - Cross Sales:** Shows 'Gross Sales' at '\$170.96M'.
  - Net Sales by Co...:** A bar chart for United States.
  - Top 10 Customer:** A donut chart for Thorou... (UK).
  - Product Category:** A donut chart for Components.
  - Sort of Sales:** A slicer for 'Online' and 'Retail'.
  - Variance chart:** A chart comparing 'Gross Sales' across units.
  - Back Button:** A circular button with a left-pointing arrow.

## Configure visuals and slicers for use in mobile reports

By default, many visuals in Power BI are responsive, which means that they change dynamically to display the maximum amount of data and insight, regardless of the screen size. As a visual changes size, Power BI gives priority to the data and makes small changes, such as removing padding or repositioning the legend, so that the data remains visible. When it comes to configuring visuals for mobile reports, Power BI does all the hard work for you. However, if you want to turn off this default responsiveness, you can do so in the **General** section of the visual's format settings.

Regarding slicers, which offer on-canvas filtering of report data, you might want to modify some settings to optimize them for mobile use. Return to the regular report authoring mode to edit the slicer settings, and then consider the following points:

- Determine whether you want to allow report readers to select only one item or multiple items.
- Decide on the orientation of the slicer, whether it should be vertical, horizontal, or responsive (responsive slicers must be horizontal). If you make the slicer responsive, as you change its size and shape, it shows more or fewer options. If you make the slicer small enough, it becomes a filter icon on the report page.



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## Next unit: Exercise - Enhance Power BI reports

[Continue >](#)

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How are we doing?    ★ ★ ★ ★ ★

# Check your knowledge

6 minutes

Answer the following questions to see what you've learned.

1. At the Contoso Skateboard Company, Sally is creating a report to show sales over time. Sally is aware that occasional spikes occur in sales revenue that could be attributed to many different reasons, such as a marketing campaign. Sally needs to ensure that supporting visuals provide explanation for the spikes. What type of visual should Sally use? \*

Line chart visual with a trend line

**✗ The answer is incorrect. A line chart visual with a trend line will not provide explanation of anomalies.**

Line chart visual with anomaly detection

**✓ The answer is correct. Adding anomaly detection to a line chart visual will highlight anomalies and provide accompanying explanations as data visuals.**

Line chart visual with forecasting

Q&A visual

2. At the Contoso Skateboard Company, Sanjay is authoring a report that will be distributed to sales managers. The report contains some sensitive data that shouldn't be exported. Which report design feature can Sanjay configure to ensure that data isn't exported? \*

Bookmark

Drillthrough page

Page tooltip

**✗ The answer is incorrect. Page tooltips allow your report consumers to gain deeper insights quickly and efficiently from a visual. It can't restrict the exporting of data.**

Visual header

**✓ The answer is correct. By disabling the More options (More options) icon, report consumers**

▼ The answer is correct. By disabling the More options (...) icon, report consumers can't export data.

3. At the Contoso Skateboard Company, Arun is building a report that will help sales managers explore sales revenue by different dimensions. Dimensions include Date, Product, Customer, Territory, and Marketing Campaign. The experience should involve a single data visual and provide guidance on which dimensions to explore. Which visual should Arun use?

\*



Decomposition tree

✓ The answer is correct. The Decomposition Tree visual helps report consumers visualize data across multiple dimensions. By using AI splits, the visual can recommend the next dimension to drill to.



Key influencers



Paginated reports

✗ The answer is incorrect. The paginated reports visual embeds a Power BI paginated report. It doesn't provide a dynamic experience to explore dimensions or guidance on which dimensions to explore.



Q&A

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## Next unit: Summary

[Continue >](#)

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How are we doing?     

# Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

## Question 5 of 50

You need to create a bookmark that toggles the visibility of a visual.

This bookmark must only toggle the visibility state and perform no other action.

Which three configurations should you make? Each correct answer presents part of the solution.

Disable the Data option.

✓ This answer is correct.

Disable the Current Page option.

✓ This answer is correct.

Disable the Display option.

Enable the Current Page option.

Enable the Data option.

Enable the Display option.

✓ This answer is correct.

The current page capture allows the bookmark to navigate back to the page of capture. The data capture updates filters and drillthrough which should not occur for this bookmark. The display capture updates visual visibility on the report page.

[Add buttons, bookmarks, and selections - Training | Microsoft Learn](#)

[Overview of bookmarks in Power BI service reports - Power BI | Microsoft Learn](#)

## Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

### Question 7 of 50

You are modifying a report in Power BI Desktop. The report contains a single report page that has three card visuals and one clustered bar chart.

You need to create a bookmark that displays only the clustered bar chart and hides the cards. The solution must minimize development effort.

What should you do first?

- Add a bookmark in the Bookmarks Pane.
- Hide the three cards in the Selection Pane.

✓ This answer is correct.

- Publish the report to the Power BI Service.
- Select the Spotlight option on the clustered bar chart.

Before you create a bookmark, you need to configure the report page to show the state you want to capture in the bookmark. Visuals are visible by default, therefore, you must mark them as hidden. To add a bookmark, you first need to update the bookmark after hiding the visuals. Bookmarks can be created in Power BI without publishing to the Power BI service. While spotlight does focus on the clustered bar chart, it does not completely hide the cards.

[Add buttons, bookmarks, and selections - Training | Microsoft Learn](#)

Next >

[Check Your Answer](#)

## Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

### Question 8 of 50

You are using Power BI Desktop to edit a stacked column chart that displays gross sales data with a date hierarchy that contains year, quarter, month, and day.

You need to prevent users from viewing the hierarchy based on the year.

What should you do?

- In the Filters pane, add a filter based on the quarter, month, and day.
- In the Filters pane, add a filter based on the year.
- In the Format pane, modify the Maximum Range setting.
- In the Visualization pane, remove the year field from the date hierarchy fields in the X-axis.

✓ This answer is correct.

To prevent users from viewing the hierarchy based on the year, you remove just the year from the date hierarchy fields in the x-axis in the Visualization pane. The quarter, month, and day will remain populated and usable. Modifying the visual Range settings in the Format pane would affect the range of values displayed in the visual. Adding a filter based on the year in the Filters pane would filter the values displayed in the visual, not remove a drilldown level. Adding a filter based on the quarter, month, and day in the Filters pane would filter the values displayed in the visual but would not prevent users from viewing the hierarchy based on the year.

[Use basic interactions - Training | Microsoft Learn](#)

## Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

### Question 9 of 50

You have a bar chart and column chart visual on a report page. Selecting any column from the bar chart visual filters the column chart data to less than 1% of its unfiltered value.

Which type of visual interaction should be used when the bar chart is filtering the column chart to ensure that you can easily see the data?

expand

drillthrough

**This answer is incorrect.**

filter

**✓This answer is correct.**

highlight

Filter will show you the filtered data in this visual. So even when showing filtered data that is less than 1% of the unfiltered value, it will still display well in the column visual. Highlight shows you both the unfiltered and filtered values in the visual, for comparison purposes. Drillthrough is a page navigation experience that takes you from one page to another plus applies a set of filters to page navigated to. Expand is a way to navigate down a level using the hierarchy controls.

[Use advanced interactions and drill through - Training | Microsoft Learn](#)

[Change how visuals interact in a report - Power BI | Microsoft Learn](#)

[Next >](#)

[Check Your Answer](#)

## Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

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Question 10 of 50

You have a visual that is being cross-highlighted.

By default, what data will be displayed in a report tooltip?

- a report page tooltip with cross-highlighted data
- both the un-filtered and filtered (cross-highlighted) data
- the filtered (cross-highlighted) data

✓**This answer is correct.**

- the un-filtered (non-cross-highlighted) total data

By default, report tooltips will apply the filter from the cross-highlighted data into the tooltip. Report page tooltips need to be manually created and are not assigned to a visual by default.

[Create report tooltip pages in Power BI - Power BI | Microsoft Learn](#)

[Create a data-driven story with Power BI reports - Training | Microsoft Learn](#)

[Next >](#)

[Check Your Answer](#)

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Question 11 of 50

You have a Power BI report that uses a dataset that is imported from a database.

You add a slicer to a report.

You need to sync the slicer to use it on other report pages.

What is required to sync slicers between report pages?

- Each slicer must be the same slicer type.
- Each slicer must be visible.
- Each slicer must have the same title.
- Each slicer must use the same column.

✓ **This answer is correct.**

The same column must be used in each slicer for them to recognize each other in the sync slicers settings. Slicers can sync even when hidden. Slicers do not need to be the same slicer type. One slicer could be a list, and the other a dropdown.

Slicers do not need the same title to allow them to be synced.

[Apply slicing, filtering, and sorting - Training | Microsoft Learn](#)

[Slicers in Power BI - Power BI | Microsoft Learn](#)

Next >

[Check Your Answer](#)

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## Practice Assessment for Exam PL-300: Microsoft Power BI Data Analyst

Question 1 of 50

You have a Power BI data source.

You need to analyze the data to meet the following requirements:

- Add a Top 10 filter to a visual.
- Ensure that the filter does NOT display in the **Filters on this visual** display for that **Visual Header** icon.
- Title the visual "Top 10 Product Category by Sales Amount".

What should you do?

- Hide **Filters on this visual** icon from the Header configuration for this visual.
- Hide the **Filters** pane panel.
- Hide the Top 10 filter in the visual level filters for this visual in the **Filters** pane.

✓ **This answer is correct.**

- Hide the visual header for this visual.

Only hiding the top 10 filter from the visual level filters in the filters pane will hide just this filter but allow other filters to show under the **Filters on this visual** icon for this visual.

Use advanced interactions and drill through - Training | Microsoft Learn

Next >

[Check Your Answer](#)